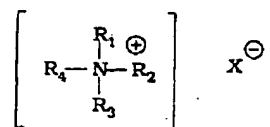


What is Claimed Is:

1. A method for producing phyllosilicate-intercalation compounds with an increased expansion volume and/or a modified onset temperature by intercalating intercalate compounds in native, expandable phyllosilicates, especially native vermiculite, characterized in that the native phyllosilicate is subjected to ion exchange with at least one cationic surfactant and, at the same time or in a further step, at least one organic intercalate compound is intercalated in the phyllosilicate, with the proviso that the intercalation of dimethylformamide, chloroform, dimethylacetamide, toluene and dimethylsulfoxide can take place also without a prior ion exchange.

2. The method of Claim 1, wherein a surface-active, quaternary alkylammonium compound is used as cationic surfactant.

3. The method of Claim 2, wherein, as cationic surfactant, a surface-active quaternary alkylammonium compound of the general formula



is used, in which R_1 , R_2 , R_3 and R_4 independently of one another represent hydrogen atoms, linear or branched, saturated or unsaturated alkyl groups, cycloalkyl groups, cycloalkylalkyl groups, alkenyl groups, aryl groups, arylalkyl groups or alkylaryl groups with 1 to 30 and preferably 1 to 18 carbon atoms and X^- represents an anion with the proviso that at least one of the R_1 , R_2 , R_3 or R_4 groups has 12 to 30 and preferably 12 to 18 carbon atoms.

4. The method of Claim 3, wherein, as surface-active quaternary alkylammonium compounds, an optionally substituted C_{10} - C_{18} -alkyl-tri- C_1 - C_6 -alkylammonium salts, C_{10} - C_{18} -dialkyl-di- C_1 - C_6 -alkylammonium salts, C_{10} - C_{18} -trialkyl- C_1 - C_6 -alkylammonium salts and/or C_{10} - C_{18} -tetraalkylammonium salts is used.

5. The method of Claim 4, wherein, as surface-active quaternary ammonium compound, decyltrimethylammonium halide, dodecyltrimethylammonium halide, tetradecyltrimethylammonium halide, octadecyltrimethylammonium halide and/or ammonium halide, preferably the chloride or bromides of these compounds are used.

6. The method of Claim 1, wherein, as organic intercalated compound, at least one compound, selected from the group comprising monovalent and multivalent, aliphatic and aromatic alcohols, monocarboxylic acid and dicarboxylic acid and their alkali or ammonium salts and amides, organic chelating agents and organic solvents, is used.

7. The method of Claim 5, wherein a compound of the general formula ROH or R(OH)_2 is used as alcohol and a compound of the general formula RCOOH or R(COOH)_2 is used as monocarboxylic or dicarboxylic acid, in which R is a linear or branched, saturated or unsaturated alkyl group, cycloalkyl group, cycloalkylalkyl group, alkenyl group, aryl group, arylalkyl group or alkylaryl group with 1 to 30 and preferably 1 to 14 carbon atoms.

8. The method of Claim 1, wherein, as organic intercalation compound, methanol, ethanol, 2-propanol, 2-butanol, t-butanol, benzyl alcohol, 1-decanol, ethyleneglycol, 1,3-dihydroxypropane, 1,4-dihydroxybutane, glycerin, formic acid, acetic acid, hexanoic acid, adipic acid, malonic acid, gluconic acid, glycolic acid, lactic acid, glyoxylic acid, trifluoroacetic acid, dimethylmalonate, diethylmalonate, methylsalicylate, malonic acid diamide, dimethylformamide, dimethylsulfoxide, nitromethane,

acetone, tetrahydrofuran, chloroform, diethyl ether, diphenyl ether, toluene ethylenediaminetetraacetic acid (EDTA) and/or their metal complexes, especially the Mg-EDTA complex and/or the Cu-EDTA complex are intercalated.

9. The method of Claim 8, wherein, as intercalate compound, ethanol, acetic acid, citric acid, malonic acid, gluconic acid, ethylenediaminetetraacetic acid, nitrilotriacetic acid or the alkali metal salts and amides of these carboxylic acids, urea and/or dimethylformamide are used as organic intercalate compounds are intercalated.

10. The method of Claim 1, wherein, in a first step, the ion exchange is brought about by treating the native, phyllosilicate with at least one cationic surfactant and, in a second step, with at least one organic intercalate compound.

11. The method of Claim 10, wherein the native phyllosilicate is suspended in a solution of the cationic surfactant in a suitable solvent, the intercalation is brought about optionally using heat, the ion-exchanged phyllosilicate is removed from the suspension, optionally washed and dried

and the organic intercalate compound is then intercalated into the ion-exchanged phyllosilicate optionally from a solution in a suitable solvent and the phyllosilicate-intercalation compound obtained is removed from the suspension, washed and optionally dried.

12. The method of Claim 1, wherein the ion exchange with the cationic surfactant and the intercalation of the organic intercalate compound in the native phyllosilicate is carried out in one step.

13. The method of Claim 12, wherein the cationic surfactant and the organic intercalate compound are used in the form of a mixture with the mixing ratio aimed for in the phyllosilicate-intercalation compound.

14. The method of Claim 13, wherein the native phyllosilicate is suspended in a solution of the cationic surfactant and the organic intercalate compound is suspended in a suitable solvent, the simultaneous ion exchange and intercalation optionally are brought out with heating and the phyllosilicate-intercalation compound obtained is removed from the suspension, washed and optionally dried.

15. The method of Claim 10, wherein the organic intercalate compounds are intercalated by the exchange of interlayer water of the phyllosilicate.

16. The method of Claim 1, wherein, as native, expandable phyllosilicate, vermiculite, hydrobiotite and/or chlorite vermiculite with an average particle diameter of 0.1 mm to 10 mm and preferably of 0.3 to 1.0 mm is used.

17. The method of Claim 10, wherein water, an aliphatic or aromatic alcohol, an ether, an ester, an alkane, a cycloalkane, an aromatic solvent and/or an amine is used as solvent.

18. The method of Claim 10, wherein a concentration of the cationic surfactant or of the organic intercalate compound in the solution of 0.01 moles/L to 5.0 moles/L and preferably of 0.1 moles/L to 1.0 moles/L is employed.

19. The method of Claim 10, wherein the ion exchange reaction or the intercalation reaction is carried out at a temperature of 10°C to 150°C and preferably of 25°C to 60°C.

20. The method of Claim 10, wherein ion exchange reaction or the intercalation reaction is carried out during a reaction time of 0.5 to 144 hours and preferably from 10 to 36 hours.

21. The method of Claim 10, wherein the phyllosilicate-intercalation compound is removed from suspension by filtering or decanting, washed with a few milliliters of the solvent used and then optionally dried.

22. The method of Claim 21, wherein drying is carried out at room temperature, under vacuum or in a drying oven at an elevated temperature.

23. The method of Claim 22, wherein drying in the drying oven is carried out from 1 to 12 hours at a temperature of 60°C to 80°C.

24. Phyllosilicate-intercalation compound, obtainable by intercalating intercalate compounds in native, expandable phyllosilicates, especially native vermiculite, characterized in that the native phyllosilicate is subjected to ion exchange with at least one cationic surfactant and, at the same time or

in a further step, at least one organic intercalate compound is intercalated in the phyllosilicate, with the proviso that the intercalation of dimethylformamide, chloroform, dimethylacetamide, toluene and dimethylsulfoxide can take place also without a prior ion exchange.

25. An intumescent material, which can be used as intumescent, fire-retarding additive and/or in expanded form as additive for producing fire-retarding materials, as well as for the production of high temperature-resistant insulation panels and seals, especially for the fire-preventing sealing of through holes, wall bushings and other openings in walls, floors and/or ceilings of buildings, said material comprising phyllosilicate-intercalation compound, obtainable by intercalating intercalate compounds in native, expandable phyllosilicates, especially native vermiculite, characterized in that the native phyllosilicate is subjected to ion exchange with at least one cationic surfactant and, at the same time or in a further step, at least one organic intercalate compound is intercalated in the phyllosilicate, with the proviso that the intercalation of dimethylformamide, chloroform, dimethylacetamide, toluene and dimethylsulfoxide can take place also without a prior ion exchange.